

Psychological Bulletin

EDITED BY

SHEPHERD I. FRANZ, GOVT. HOSP. FOR INSANE

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HOWARD C. WARREN, PRINCETON UNIVERSITY (*Review*)

JOHN B. WATSON, NEW YORK (*J. of Exp. Psych.*)

JAMES R. ANGELL, YALE UNIVERSITY, (*Monographs*) AND

MADISON BENTLEY, UNIVERSITY OF ILLINOIS (*Index*)

WITH THE CO-OPERATION OF

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SHEPHERD I. FRANZ, GOVT. HOSP. FOR INSANE (*Bulletin*)
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THE PSYCHOLOGICAL BULLETIN

PROCEEDINGS OF THE THIRTY-FIRST ANNUAL
MEETING OF THE AMERICAN PSYCHOLOGICAL
ASSOCIATION, CAMBRIDGE, MASSACHUSETTS,
DECEMBER 27, 28, 29, 1922.

REPORT OF THE RETIRING SECRETARY, EDWIN G. BORING,
HARVARD UNIVERSITY

The American Psychological Association held its thirty-first annual meeting at Harvard University on Wednesday, Thursday, and Friday, December 27, 28, and 29, 1922. The sessions were held in Emerson Hall, with the exception of the session of the Section of Clinical Psychology on Friday afternoon which was held at the Boston Psychopathic Hospital. One hundred and thirty-nine persons registered but it is probable that some of the members present failed to record their names. There were one hundred and seventy persons present at the annual banquet.

The Program Committee, in furtherance of the policy of preceding program committees, sought to add to the interest of the program and to encourage discussion in the following ways: In 1921 the number of papers per session had been reduced on the average from eight to six; the present Committee further reduced the papers per session to five, and sought to avoid parallel sessions, although the pressure for inclusion in the program is so great that it is not possible entirely to avoid simultaneous meetings. The Committee followed the plan of placing general and theoretical papers at the beginning of the program, experimental papers next, and

papers in applied and clinical psychology last. The sessions were extended through the afternoon of the third day, and the programs of the Section of Clinical Psychology were placed in the morning and afternoon of this day. This arrangement made it possible for persons interested only in clinical psychology to come late to the meetings and for persons whose interest was only in theoretical and experimental psychology to leave early. It proved necessary to have parallel sessions on the afternoon of the first day and the morning of the third; but even then it was possible to begin the sessions at different hours so that the overlapping was only partial.

On the second day of the meetings a joint session was held with Section I of the American Association for the Advancement of Science and a symposium on the application of psychology was presented by Section I. Mr. Bott, the retiring vice-president of that Section, gave his address on "Criticism and Ways of Inquiry." By arrangement with Section I the Association presented no competing programs at this time, and Section I agreed in return not to compete with the programs of the Association at other times.

It was the suggestion of the Program Committee that some general session on a topic of vital interest, a "symposium," should be held every year, and that in years when the Association met with the American Association for the Advancement of Science this session should be left to Section I to arrange.

In all thirty-seven papers were presented in the sessions of the Association. Of these papers five dealt with general psychology, five with experimental psychology, four with comparative psychology, five with applied psychology, nine with mental measurement and nine with clinical psychology. The last three topics are so closely related as to be almost undistinguishable. It is interesting to note that about 62 per cent of the material presented dealt with applied or clinical psychology or the tests; that only 24 per cent of the papers were in experimental or comparative psychology; and that only 14 per cent dealt with general psychology. It would seem that this distribution represents a shift of interest within the Association.

The annual business meeting was held on Wednesday evening at eight o'clock. The action sheet called for twenty-six items of business, and the policy adopted in 1921 of devoting an entire evening to the business session proved advantageous. Nearly three hours were devoted to the business session.

The annual banquet was held in the Harvard Union on Thursday

evening. After the banquet Mr. Dunlap, as President of the Association, presented the President's address on "The Foundations of Social Psychology."

The apparatus exhibit was held in the Psychological Laboratory of Emerson Hall.

After the session of the Section of Clinical Psychology at the Boston Psychopathic Hospital on Friday afternoon, Mr. Campbell and Mr. Wells arranged for the members to see the hospital and some of its methods of work.

TRANSACTIONS OF THE ANNUAL BUSINESS MEETING

The annual business meeting was held on December 27, 1922, at eight o'clock, in Emerson Hall.

It was voted that the minutes of the thirtieth annual meeting, at Princeton, be approved as printed.

The Secretary made the following announcements:

That the Association was represented at the annual meeting of the American Academy of Political and Social Science in Philadelphia on May 12 and 13, 1922, by Miss Johnson and Messrs. Doll and Fernberger;

That the Association was represented at the 100th anniversary of the founding of Hobart College on June 13, 1922, in Geneva, N. Y., by Mr. Dallenbach;

That the Association was represented at the inauguration of Chancellor Flint of Syracuse University on November 17, 1922, by Mr. May;

That by action of the Council Mr. W. V. Bingham attended, as delegate of the Association, the meeting of the Conference on World Standardization, held under the auspices of the American Chemical Society at the Carnegie Institute of Technology on September 6, 1922. The conference dealt with matters pertaining to the adoption of the metric system, and Mr. Bingham as secretary of the conference has published its report in *Science*.

The Secretary also announced the resignations during the year 1922 of Dr. J. H. Bair and Professor F. S. Hoffman.

The Treasurer's report as printed below was read and approved.

The Treasurer reported the following estimate of resources for the year 1923:

ESTIMATE OF RESOURCES:

Cash on hand.....	\$8.00
Cash on deposit.....	263.68
Dues (approximate).....	875.00
Interest (approximate).....	50.00
Sale of monographs (approximate).....	5.00
	<hr/> \$1201.68

It was voted to adopt the amendment to the Constitution adding the Treasurer to the Council. The amendment consisted in the change of the third sentence of Article II to read:

The President, the Secretary, and the Treasurer shall be ex officio members of the Council.

Since this amendment had previously been approved at the thirtieth annual meeting, it became immediately effective.

On recommendation of the Council it was unanimously voted that Article IV of the Constitution be amended by the substitution of the word "five" for the word "two" so that the article should read:

The annual subscription shall be five dollars in advance. Nonpayment of dues for two consecutive years shall be considered as equivalent to resignation from the Association.

The Council recommended that By-law 13 be amended by the substitution of "\$500" for "\$250," so that the Secretary should have an annual stipend of \$500. It was unanimously voted that the Secretary's stipend should be \$500 for the year 1923.

On recommendation of the Council it was unanimously voted that it was the sense of the Association that the stipend of the Secretary should be increased to \$1200 whenever funds became available. It was pointed out in discussion that such a stipend was necessary in order to provide adequate clerical assistance to the Secretary under the increase of business of the Association, and that at such times during the year as the Secretary should not require the full assistance of a stenographer it is proper that he should have the use of the stenographer for his personal services in order that he may be freed for the scientific work upon which his duties as Secretary would otherwise encroach.

On recommendation of the Council it was voted that By-law 1, dealing with the election of officers, be amended by addition of the following sentence:

The Council shall propose six persons for the position of member of the Council, and the Election Committee shall print these six names on the nominating ballots together with two blank spaces in which voting members can insert other names, requiring the voting members to vote for two persons on the nominating ballot.

The reason for this change lay in the present operation of the system for nomination by mail ballot, under which nomination is made by a very few votes and a very large scatter of votes occurs. The situation is shown below in the quotations from the report of the Committee on Election of Officers. The change places initiative for nomination of members of the Council in the hands of the Council, but leaves it possible for members of the Association to make other nominations. It does not affect Article III, Section 2, of the Constitution, which requires both a nominating ballot and a subsequent election ballot in which the vote is limited to the names selected as a result of the nominating ballot.

On recommendation of the Council it was unanimously voted that By-law 5 be amended by the addition of the sentence:

Election to membership shall not be effective unless the initial dues are paid within three months after the action of the Association.

The Council recommended that By-law 1 be amended by addition of the sentence:

Members who are in arrears on October 15 in any calendar year shall not have the right to vote for officers in that year.

It was voted unanimously to refer this recommendation back to the Council.

The Council recommended that a committee of three be appointed to consider ways and means of incorporation of the Association; and that the committee be authorized to proceed with national incorporation if such a course seemed advisable to the committee. The motion to amend the recommendation by striking out the second sentence and adding the provision that the committee report to the Council was lost. It was then voted to amend the recommendation by requiring the committee to report to the Council and by giving the Council power to take any action desirable. The recommendation of the Council as thus amended was approved.

On recommendation of the Council it was voted that committees, with the exception of the Election Committee, be instructed to submit their reports to the Council for discussion and possible recom-

mendation, and that they be required to mail their reports to the Secretary so that they shall be in his hands three weeks in advance of the annual meeting. In discussion it was suggested that it should be the Secretary's duty to remind chairmen of committees of this provision early in the fall of each year.

On recommendation of the Council it was voted that the Treasurer be bonded for an amount to be determined by the Council.

The Treasurer presented a budget for the year 1923 of \$1600, requiring, in view of the estimate of resources given above, the withdrawal from the principal fund of \$400. This budget is printed below except that it includes an additional \$100 subsequently authorized for the Committee on Library Check Lists of Psychological Books and the withdrawal of an additional \$100 from the principal fund to cover this item. The budget of the Treasurer as presented and the withdrawal of \$400 from the principal fund was approved.

On recommendation of the Council Mr. John E. Anderson was elected Secretary of the Association for the term 1923-1925.

On recommendation of the Council Mr. Dodge and Mr. Yerkes were elected to represent the Association on the Council of the American Association for the Advancement of Science in 1923.

The Secretary announced for the Council the appointment of the following Program Committee for 1923: Mr. Anderson, chairman, Mr. Dodge and Mr. Poffenberger. This Committee was appointed by the Council with the instruction that it act in consultation with the President.

The Council recommended that the personnel and terms of the Standing Committee on the Relation of Psychology to Public Welfare, established by paragraph 11 of the report of the Committee on Certification of Consulting Psychologists in 1921, be as follows: Mr. Warren, chairman, 1923; Mr. Boring, 1923-24; Mr. Franz, 1923-25; Mr. Dodge, 1923-26; Mr. Yerkes, 1923-27. Mr. Warren from the floor declined to serve and Mr. Woodworth was nominated in his place as chairman and for the term of one year. The recommendation of the Council, with the substitution of Mr. Woodworth for Mr. Warren, was adopted.

On recommendation of the Council it was voted that the Association accept the invitation of the University of Wisconsin to meet in Madison in 1923, that the meetings be held on December 27 to 29 inclusive, and that Mr. Henmon be elected as local member of the Executive Committee.

On recommendation of the Council the twenty-one persons nominated below were elected to membership in the Association.

Possessing the degree of Doctor of Philosophy and elected in regular course:

1. Bregman, Elsie Oschrein, Research Psychologist, Teachers College, Columbia University.
2. Brooks, Fowler Dell, Associate in Education, Johns Hopkins University.
3. Bunch, Cordia C., Research Assistant, University of Iowa.
4. Cason, Hulsey, Assistant Professor of Psychology, University of Kansas.
5. Dooley, Lucile, Associate Clinical Psychiatrist, St. Elizabeths Hospital.
6. Gaw, Esther Allen, Associate Dean and Head Personnel Bureau, Mills College.
7. Halverson, H. M., Professor of Psychology, University of Maine.
8. Hansen, Clarence Frederick, Assistant Professor and Assistant Director, Bureau of Personnel Research, Carnegie Institute of Technology.
9. Ide, Gladys Geneva, Director of Special Education, Philadelphia Public Schools.
10. Knight, Frederic Butterfield, Associate Professor of Psychology and Education, University of Iowa.
11. Marston, William Moulton, Professor of Psychology, American University.
12. Miller, Karl Greenwood, Assistant Professor of Psychology, University of Pennsylvania.
13. Poull, Louise E., Psychologist, Children's Hospital, Randalls' Island, N. Y.
14. Reamer, Jeannette C., Psychologist, Board of Education, Cleveland, Ohio.
15. Ruch, Giles Murrel, Assistant Professor of Psychology and Educational Psychology, University of Iowa.
16. Schoen, Max, Assistant Professor of Psychology, Carnegie Institute of Technology.
17. Sullivan, Elizabeth T., Psychologist and Assistant Director, Department of Psychology and Educational Research, Los Angeles Public Schools.
18. Viteles, Morris Simon, Instructor in Psychology, University of Pennsylvania.
19. Young, Kimball, Assistant Professor of Psychology, Clark University.
20. Zigler, Michael Jacob, Instructor in Psychology, Princeton University.

Not possessing the degree of Doctor of Philosophy, but on the ground of high attainment in a field closely related to psychology and for his present interest in psychology:

21. Priest, Irwin G., Physicist, Bureau Standards, Washington, D. C.

Miss Washburn reported for the Committee on the Election of Officers the following elections:

President: L. M. Terman, Stanford University.

Members of the Council, 1923-1925: Edwin G. Boring, Harvard University; June E. Downey, University of Wyoming.

Nominees for appointment to the Division of Anthropology and Psychology of the National Research Council: Raymond Dodge, Wesleyan University; R. S. Woodworth, Columbia University.

As bearing upon the reason for the change in the method of nomination of members of the Council, the following excerpts from the report of the Committee on the Election of Officers are of interest:

Nomination. Thirty-three persons received one or more votes of nomination for President, and 105 persons received one or more votes of nomination for the Council. The highest number of votes nominating any one person for the Council was 17.

Election. Two hundred and ninety-three votes were cast. Of the 149 members not voting only 15 per cent are engaged in teaching psychology.

Mr. F. L. Wells presented the report of the Standing Committee on the Certification of Consulting Psychologists as printed below. There was considerable discussion which dealt with the difference of opinion as to whether the modification of the method of certification recommended in the report, as against the report of 1921, was desirable. It was moved that the report be accepted and its recommendations adopted. It was then moved to amend the report by changing the words "five dollars" to "thirty-five dollars," and providing that these fees be available to the Section of Clinical Psychology for its work in determining the qualifications of members of that Section. The amendment was lost and the original motion was lost. A motion that the Committee be discharged was then lost. It was then moved that the Committee be continued for the ensuing year under its old instructions and that it confine its certification to members of the Section of Clinical Psychology. A motion to amend this motion to require that the certification be that of "consulting clinical psychologist" was lost; and the original motion continuing the Committee was adopted.

Miss Washburn presented the report of the Committee on the Relation of the Association to Publication as printed below. The Committee asked to be continued in order that negotiations under way might be completed. In this connection the Council recommended that the Association take up Mr. Warren's option for the purchase of the Psychological Review publications before 1928, provided that Mr. Warren would extend the time for the taking up of the option, in case of Mr. Warren's death or decision to dispose of his holdings, from six months to one year, and provided that the Association could see ways ultimately to finance the purchase, and further that

the Committee on the Relation of the Association to Publication be continued to consider the situation. Mr. Warren from the floor offered to extend the option under the special conditions mentioned from six months to one year. It was voted to accept the report and to continue the Committee. It was voted to thank Mr. Warren for his generous offer and to instruct the Committee on the Relation of the Association to Publication to draw up the papers necessary to make the option effective.

Mr. Weld reported for the Committee on Check Lists of Psychological Books as printed below. It was voted that the report be accepted and its recommendations be adopted. It was voted to authorize the withdrawal of \$100 from the principal fund for the work of this Committee. This item has been added to the budget as printed below.

The President then called for new business.

It was voted that the Committee on the Relation of the Association to Publication be instructed to consider what steps could be taken to encourage members to subscribe to the abstract journal under present conditions and to encourage their participation in the abstracting.

It was voted that the Association extend a vote of thanks to the Department of Psychology at Harvard and to the authorities for their generous entertainment.

The meeting adjourned at 10:55 P.M.

EDWIN G. BORING,

Secretary

NEW COMMITTEES

In addition to the information contained in the minutes concerning the new personnel of committees, the following announcements are made:

The President appointed Mr. F. L. Wells to succeed himself for the term 1923-27 on the Standing Committee on the Certification of Consulting Psychologists.

The President appointed the following committee on the incorporation of the Association: Mr. Yerkes, chairman, Mr. Dunlap and Mr. Yoakum.

With the authorization of the Council, the President appointed a committee consisting of Mr. Cattell, chairman, Mr. W. V. Bingham and Mr. Watson, to consider the organization of a section of industrial and commercial psychology, to formulate plans for such an

organization if they find it desirable, and to report to the Council.

With the authorization of the Council, the President also appointed a committee, consisting of Miss Buford Johnson, chairman, Mr. Freeman and Mr. Whipple, to consider the organization of a section of educational psychology, to formulate plans for such an organization if they find it desirable, and to report to the Council.

REPORT OF THE TREASURER FOR THE YEAR 1922

Dr.

To Balance from the previous year	\$1988.52
Dues received from members.....	879.00
Interest, July 1, 1921, to October, 1922.....	61.94
Sale of Monographs 51 and 53 in 1921.....	7.52
Sale of abstracts, 1921 meeting.....	14.79
Miscellaneous85
	<hr/> \$2952.62

Cr.

By Printing and supplies.....	\$173.68
Postage	57.12
Addressograph and cabinet.....	77.20
Reprints	261.16
Abstracts	54.28
Incidentals of meeting, 1921.....	5.42
Election committee	47.25
Edison prize	500.00
Secretary's stipend	250.00
Treasurer's stipend	50.00
Exchange on checks.....	4.46
	<hr/> \$1480.57
Cash on hand.....	\$8.00
Balance in Fifth Avenue Bank.....	263.68
Balance in Union Dime Savings Institution.....	1200.37
	<hr/> 1472.05
	<hr/> \$2952.62

SAMUEL W. FERNBERGER,

Treasurer

PHILADELPHIA, PA.

December 21, 1922.

Audited and found correct:

HERBERT S. LANGFELD

F. L. WELLS

December 26, 1922.

BUDGET FOR 1923

The total budget for 1923, including the withdrawal from the principal fund of the sum of \$500, is as follows. The Association adopted the budget and authorized the withdrawal.

Printing and supplies.....	\$400.00	
Postage	100.00	
Reprints	250.00	
Abstracts	100.00	
Incidentals of meeting.....	100.00	
Apparatus exhibit	25.00	
Election committee	75.00	
Library Check List Committee	100.00	
		\$1150.00
Secretary's stipend	\$500.00	
Treasurer's stipend	50.00	
		550.00
		\$1700.00

REPORT OF THE STANDING COMMITTEE ON THE CERTIFICATION OF CONSULTING PSYCHOLOGISTS

The Committee presents the following report:

RECEIPTS

Fees of 21 applicants from Clinical Section at \$35 each.....	\$735.00
Fees of 4 other authorized applicants at \$35 each.....	140.00
	\$875.00

EXPENDITURES

Returned to applicants pending action of Association, 12 fees at \$35 each	\$420.00
Traveling expenses of two committee meetings.....	170.30
Printing and stationery.....	78.20
Equipment (office)	69.63
Legal fees	15.00
Postage and miscellaneous.....	9.18
Cash on hand	1.03
On deposit, Brookline Trust Co.....	111.66
	\$875.00

The recommendations of the Committee are as follows:

1. That there be established a Section of Educational Psychology and a Section of Industrial Psychology, with standards coördinate with those of the present Section of Clinical Psychology.

2. That members of these Sections shall on application receive a formal certificate of such membership from the President and Secretary of the Association, and that the fee for the issue of such certificate be \$5.00, payable to the Association.

3. That the President appoint a committee of three persons interested in educational psychology to supervise the organization of the Section of Educational Psychology; also a committee of three persons interested in industrial psychology to supervise the organization of the Section of Industrial Psychology.

4. That the Section of Clinical Psychology appoint a committee of three to meet with the Committees on Industrial and Educational Psychology as a joint committee to maintain a coordination of standards among the sections.

5. That persons at present holding certificates of membership in the Section of Consulting Psychologists be authorized to exchange these certificates for certificates of membership in the Section of Clinical Psychology, and that upon such exchange the Association refund to each member on surrender of such certificate the sum of \$30.00, this being the excess over the fee of \$5.00 above proposed; and that the Secretary be empowered to draw \$300.00 from the fund for this purpose.

6. That the property and funds now assigned to the Committee be turned over to the Secretary of the American Psychological Association.

7. That the Section of Clinical Psychology and the Sections contemplated in this report consider the matter of certifying the status of psychologists not eligible to membership in the Association, but competent in psychological work under direction.

8. The functions of the Committee of Consulting Psychologists being otherwise delegated by provisions of this report, the Committee recommends its discharge.

9. The Committee recommends that all previous action by the Association in conflict with the provisions of this report be hereby rescinded.

F. L. WELLS,

Executive Officer

December 27, 1922.

REPORT OF THE COMMITTEE ON THE RELATION OF THE ASSOCIATION TO PUBLICATION

The committee which preceded the one now reporting considered two topics: (1) the general relation of the Association to psychological publications; (2) the feasibility of establishing a journal of abstracts in some relation to the Association. On neither of these topics was it able to bring in a recommendation; it asked for its discharge and recommended that a new committee be appointed to review the results of investigation to be made by Dr. Yerkes of the cost, circulation, etc., of all existing psychological periodicals, and to formulate general recommendations to the Association.

The present committee appointed in pursuance of this recommendation has not fulfilled the first part of its allotted task, namely, to review the results of the investigation to be made by Dr. Yerkes. It appeared on

correspondence with Dr. Yerkes that the statement in the previous committee's report was in error: he intended to offer not his personal services but those of the Information Service of the Research Council. This latter offer he repeated, but in the meantime the Division of Anthropology and Psychology of the National Research Council had appointed a committee to consider plans for an abstract journal. With the advice of Dr. Yerkes the committee now reporting deferred consideration of information regarding psychological periodicals in general and acting under its second instruction, to formulate general recommendations to the Association, devoted itself to renewed consideration of the matter of the journal of abstracts. It met with the Research Council's Committee on December 2, Professor Warren being also present. The difficulty of the situation with regard to the abstract journal is that while Professor Warren and his associates of the Psychological Review Publications have been for the past two years conducting an abstract journal as part of the Psychological Bulletin, at a sacrifice of time and energy which it would be ungrateful to ignore and with an accumulation of resources and experience which it would be highly unwise to set aside, funds for the further development of this journal (not for its present maintenance: it is self-supporting) can not be obtained either from the Association, which in 1920 refused to grant funds to a privately owned journal, or from the resources at the command of the Division of Psychology of the Research Council, so long as the journal remains private property.

At the joint meeting of the two committees and by subsequent correspondence of a subcommittee, a compromise was arrived at, embodied in the following proposal from Professor Warren: he will grant an option to the American Psychological Association to purchase the entire capital stock of the Psychological Review Company, consisting of 110 shares at \$50.00 a share, plus unpaid dividends at 5 per cent from date of incorporation (1911). This option will extend to January 1, 1928. Provided that in case of the grantor's decease, or decision to dispose of his holdings, then the Association shall within six months of the decease or of notification that sale is contemplated, either purchase the stock or forfeit the option. Unpaid dividends at present amount to 42 per cent. This proposal requires endorsement by the Council.

Your committee therefore begs to report progress and asks to be continued in order that the negotiations under way may be completed.

M. F. WASHBURN,

December, 1922.

Chairman

REPORT OF THE COMMITTEE ON CHECK LISTS OF PSYCHOLOGICAL BOOKS

The Committee recommends:

A. That the Committee be continued and that it be authorized:

1. To communicate with the psychologists of the chief colleges and universities in the United States, and request them, after conference with the librarians of their several institutions, to designate a topic or topics in

which their library might with advantage concentrate its efforts by purchasing rare and old books and all important new books as issued.

2. To coördinate the submitted lists and designate certain libraries to cover certain topics, with the object of having every topic fully covered by some library, and to avoid reduplication in the purchase of rare books.

3. To prepare for the information of psychologists a list of these topics with names of the libraries which are specializing in each.

4. To urge the respective libraries to send duplicate cards of their card catalogue to the Library of Congress, so that the location of all psychological books may be recorded at one central place.

5. To consider the designating of an agency in Washington (through the National Research Council or otherwise), to which psychologists may write for information concerning the location of psychological works in this country.

B. That the Association appropriate \$100.00 for the expenses of the work of the Committee, any balance to be subject to the disposal of the Association at its 1923 meeting.

C. That, provided the work can be accomplished before the 1923 meeting, the Committee report to the Association its recommendations concerning future policy and procedure.

It is understood that the Committee, in communicating with the various institutions, will do what it can to secure from them full coöperation in loaning rare books to other institutions.

It is also understood that the appointed Committee will confer with a somewhat similar committee of the American Library Association in an effort to avoid duplication and to secure coöperation of effort.

Respectfully submitted,

H. C. WARREN

H. P. WELD

ROSWELL P. ANGIER,

Chairman

December, 1922.

LIST OF PAPERS

GENERAL PSYCHOLOGY

- C. C. Pratt, The Present Status of Introspective Technique.
R. M. Ogden, The Phenomenon of "Meaning."
L. L. Thurstone, The Nature of Intelligence.
M. W. Calkins, An Appeal to McDougall against McDougall.
• J. R. Kantor, Does Psychology Need a New Conception of Personality?

APPLIED PSYCHOLOGY

- W. V. Bingham, On the Possibility of an Applied Psychology.
H. D. Kitson, Height and Weight as Factors in Selling Ability.
F. A. Kingsbury, A Scale for Grading Banking Jobs.
L. M. Gilbreth, The Magster.
E. S. Jones, The Problem of Vocational Prognosis of College Students.

EXPERIMENTAL PSYCHOLOGY

- D. Starch, Color Preference and the Munsell System.
H. S. Langfeld, The Effect of Colors.
C. E. Ferree, The Theory of Flicker Photometry.
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- A. M. Jordan, Intelligence Tests Correlated with Criteria.
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 L. C. Pressey, The Development of Interests in Children and Adolescents.

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 R. H. Gault, An Unusual Case of Sensory Discrimination and Synaesthesia.
 S. D. Robbins, Stammering vs. Normal Speech.
 C. M. Campbell, The Sucking Habit in Childhood and Personality.
 A. Gesell, A Clinical Psychology of Pre-school Children.
 A. C. Perrin, Methods and Results in the Experimental Investigation of Attitudes and Complexes.
 J. E. Anderson, The Dream as a Reconditioning Process.
 J. E. W. Wallin, The Pathogenesis of Mental Inferiority and the Prevention of Degeneracy.
 W. F. Dearborn, The Relations of Feeble-mindedness to Delinquency.

ABSTRACTS

GENERAL PSYCHOLOGY

WEDNESDAY, DECEMBER 27, 10 A. M.

The Present Status of Introspective Technique. C. C. PRATT,
 Harvard University.

The methods of observation and description in that branch of psychology which approaches mind from the side of existential process have undergone various changes. An historical review of

these methods reveals as many as a score of more or less distinct differences in the theory and practice of psychological inspection ranging from the early less critical attempts to report upon mental process, through the period when systematic experimental introspection was pushed to its limits in investigations of higher thought processes by Külpe and Baird, down to the present day when a reawakening of interest in psychophysical experimentation is bringing with it a critical examination of the possibility of univocal determination of mental process and report.

A survey of recent psychophysical literature brings to light two significant trends in introspective technique. On the one hand it seems that any attempt at a complete description of a total consciousness which extends beyond a very short temporal interval can only hope to yield gross qualitative data which *per se* are of small scientific value. On the other hand these data may furnish invaluable indication of what material exists for further analysis within a given experience. This analysis may be effected by the introspective technique employed in current psychophysical experiments in which by means of rigid instructional controls the attributive aspects of elementary experience are made the unequivocal objects of attentive isolation.

The Phenomenon of "Meaning." R. M. OGDEN, Cornell University.

From a point of view that relinquishes the search for elemental conscious entities and, instead, proposes to describe consciousness entirely in terms of the integration of attributive aspects, the structure of a meaningful experience may be approached in a way which suggests a reinterpretation of the data previously reported in support of "imageless" contents. The argument of this paper is that the essential feature of the consciousness of meaning—which in a previous experimental study was designated by the author as an act of relation based upon the "nucleus" of the experience—is nothing other than the perception of the stimulus word or object, determined explicitly as to its "context" by the "contours" of the phenomenal pattern which mark it off from the general level or background of experience. We must now admit that elements of thought have failed to win a place in systematic psychology; a failure to which they were foredoomed by the lack of descriptive data with which they could be given a systematic setting. However, in discarding all elements, both imaginal and imageless, observation can now be

directed exclusively upon the attributive aspects of the perceived whole—thus enabling us to review the pattern of meaning and to undertake anew the task of describing both the “figure” of thought and the phenomenon of its outline. Of these two problems the first has already been successfully attacked in the investigation of the perception of movement; for the phenomenon of movement proves to be neither a sensation nor an image, but an integration of qualitative and durational attributes. The possibility of phenomenal integrations which may even lack the attribute of *quality* is thus indicated, though not yet proved. The second problem concerns the “contours” of experience, a study of which may be expected to clarify the nature of *context* as a condition of meaning. Here investigation is not far advanced, though significant data are indicated by Rubin in his study of visually perceived figures. The point of view from which a reinterpretation of the phenomenon of meaning is here suggested denies validity both to *elementarism* and *intentionalism*; in place of which a theory of *integration* is advanced, that applies equally to the phenomena of experience and to its conditions.

The Nature of Intelligence. L. L. THURSTONE, Carnegie Institute of Technology.

To perceive is to anticipate experience. A visual sense impression is completed into a percept by the anticipation of the contact experience to which the visual impression is equivalent. The visual cue “means” a contact experience. The percept is in fact an incomplete contact experience, the details of which are not yet completely specified. The trial and error process may take place with alternatives which are all executed in overt and consummatory form by which all failures are recorded in the environment. That is relatively unintelligent behavior. The trial and error process may also take place with alternatives which are still incomplete, tentative, approximate, skeletal, universal or loosely organized. That is more intelligent behavior. Intelligent conduct consists in carrying on the trial and error process among actions that are as yet incomplete and approximate. In this way many failures are eliminated, while they are still only approximations to conduct, before they have become overtly defined.

The greater part of a percept is imaginal. It is only the insignificant cue of the percept which is sensorial. Continue the development marked by the progress from overt trial and error to the trial and error among perceived or approximate actions and we come to the

capacity to anticipate experience in the absence of the sensorial cue. That is ideational intelligence. An idea is also an incomplete, expected experience which is accepted or rejected in terms of its potential completion. Ideas are loosely formulated, incomplete conduct. The trial and error process may take place ideationally in which case the alternatives constitute anticipated lines of conduct which are as yet only skeletal. Perceptual and ideational intelligence differ in degree only, in their relative remoteness from the determining sensorial cue, in the degree of completeness of the act at which its overt fulfilment is anticipated. Ideational trial and error is still more intelligent than perceptual trial and error.

The amount of intelligence is measured by the degree of incompleteness of the alternatives in the effective trial and error life of the actor. The highest intelligence, conceptual intelligence, consists in the capacity to carry on effective trial and error among the crude, loosely organized and incomplete actions which we know as concepts. A concept is, in fact, expected conduct, so loosely organized, so tentative and incomplete, that its particular expression is not specified in the concept moment. The derivation of the concept is retrospective but the concept itself is anticipatory when it is actually working.

An Appeal to McDougall Against McDougall. MARY WHITON CALKINS, Wellesley College.

An outstanding virtue in McDougall's psychological doctrine is, in the opinion of the present writer, the conception which, in a recent paper, he formulates in the following words: "All experiencing is the experience of some one. . . . When we refer to a fact of experience, we imply *some one* thinking of *some thing*."¹ This doctrine is no new and sudden discovery; it is implied or stated in McDougall's earlier writing.² But he has not made thorough use of this basal conception of "experience" as "always the experience of some subject" in the working out of his psychological conceptions. This failure to apply his own doctrine is apparent not only in his repeated description of mind as "an organized system of forces,"³ but also in his treatment of concrete experiences, especially the emotions and sentiments, in terms not of persons experiencing objects

¹ "Prolegomena to Psychology," *Psychological Review*, 1922, XXIX, p. 40.

² Cf. *Social Psychology*, Chap. I; *Psychology, The Science of Behavior*, Chap. III, p. 81.

³ *Psychology, The Science of Behavior*, p. 230; *The Group Mind*, p. 141.

but of emotions fusing together.⁴ It is evident also in his treatment of "negative and positive self-feeling." For McDougall here discusses, under a single set of terms, on the one hand the instincts of self-display and shame (or slinking); on the other hand what are (in McDougall's phraseology) fundamental "innate tendencies," attitudes of the experiencing subject, basal (one or other of them) to every emotion, sentiment, and volition.

Does Psychology Need a New Conception of Personality? J. ROBERT KANTOR, Indiana University.

Personality study is probably the central problem of human psychology. Are not all discussions of the self attempts to describe personality? Again, the importance of a personality conception is appreciated by those who work with psychological tests, for they recognize that we must not confine ourselves to the study of intelligence merely, but must consider other phases of the personality.

If a personality conception is so important must we not then insist that such a conception be adequate for our psychological needs? Are the traditional personality conceptions adequate? Apparently not. For the psychopathologist's recent emphasis upon personality really constitutes a protest against the personality views developed under the auspices of a metaphysical mind-body psychology. So far as abnormal phenomena go the personality conception based upon the mind-body division implies that defective individuals are either suffering from conflicting consciousness or from lesions in the nervous system. At best, these conceptions can each fit only a few types of cases.

We deem it necessary, therefore, to have a better conception of personality, if only for handling abnormal cases. But perhaps more important still is it to have an adequate conception as a general method of handling all psychological facts.

Can a better conception of personality be suggested? In answer we submit an objective formulation, according to which personality consists merely of the sum total of the person's specific reactions to particular stimuli. Such a conception merely constitutes a precise description of the everyday activities of actual persons. What has such a view to recommend it? On the abnormal side, it shows us how any specific personality is built up and why he can become defective in a great variety of ways, and all on the basis of the

⁴ Cf. *Social Psychology*, pp. 132, 143 et al. (1st ed'n).

person's acquisition of reactions while in contact with specific stimuli conditions. On the normal side, it enables us to avoid any kind of spurious mind-body problem. Memory, for instance, is described not in terms of a mystic subconscious reservoir or a fanciful relation of neurones and ideas but rather in terms of actual informational or other responses acquired in contact with specific stimuli which operate in the presence of substitutes for the original stimuli. Above all, on the basis of an objective personality conception personality means not the behavior of a mind-driven body but the behavior of an actual person as we observe him to act on the street and in the laboratory.

APPLIED PSYCHOLOGY

WEDNESDAY, DECEMBER 27, 2 P. M.

On the Possibility of an Applied Psychology. W. V. BINGHAM,
Carnegie Institute of Technology.

Has the time arrived when a psychotechnology can be segregated from the science of psychology?

Some psychologists assert both the nonexistence and the impossibility of an applied psychology. Then deny, for instance, that there exists a worthy educational psychology differing radically in content from the pure psychology of learning, perception, reasoning and conation. Similarly, the psychology of advertising, of jurisprudence, of medicine and of industry, is held to be of necessity merely the precipitation of common sense or else a selection of topics from general psychology, attired in cloaks of illustration from these several occupations. As rapidly as new findings in the applied field are scientifically verified, they take their places in the system of psychology. Hence, there exists no separate body of knowledge to be called applied psychology.

It is the contention of this paper that there is the possibility of an applied psychology—an independent technological discipline with its own aims and regulative conceptions. A straightforward recognition of this possibility and of these differentia will have beneficial consequences in the conduct of research, in the editorial policy of the psychological journals, and in the organization of instruction.

Writers of to-day are not always keeping in mind the contrast between a science and a technology. Certain recent textbooks reveal here a deplorable ambiguity of objective. Some announce, as of old, that psychology is a science, and as such aims at description, classi-

fication and explanation; but other writers are not content with this goal. We must aim, they say, at increasing our knowledge of human nature *in order that we may control it*. Psychology must not only satisfy our intellectual hungers; it must also forge a technique wherewith to modify conduct.

Can psychology be at once a science and a technique? Rather, is it not possible to develop a pure science and also a psychotechnology which shall be as distinct from it as is medicine from physiology, or engineering from physics? Pure psychology completes its task with description and explanation. The practical functions of prediction and control lie beyond its scope and constitute the proper subject-matter of psychotechnology.

Height and Weight as Factors in Selling Ability. HARRY D. KITSON, Indiana University.

In order to secure some facts regarding the oft heard claim that unusual tallness and unusual heaviness are assets to a salesman, enabling him to "overawe" and "dominate" his clients, records were secured of the commissions earned by 600 salesmen of rubber footwear, of insurance, and of a high grade office specialty, whose height and weight were known.

Rank in amount of commissions earned correlates with rank in height by .11; with rank in weight by .05.

The differences between the average height of the salesmen in the best third and the average height of those in the poorest third are negligible.

If there is any significance to be attached to any certain height and weight, there is some evidence tending to show that the advantage lies with men of average stature—i.e., about 5 ft. 9 in., with appropriate weight.

A Scale for Grading Banking Jobs. FORREST A. KINGSBURY, University of Chicago.

This describes a job grading scale devised and adopted in two leading national banks of Chicago and Detroit. It illustrates the possibility of valid standardization of opinions about job requirements in situations where, because of highly specialized duties and varied working conditions, more directly objective methods of measurement are out of the question.

By means of critical job analyses, data concerning each type of

position (several hundred in all) were obtained, and the minimum or standard requirements for each determined. Each job was then graded by assigning proper numerical weight to each of the eleven factors composing the scale, namely: (1) Complexity of duties, 1 to 3; (2) executive responsibility involved, 0 to 6; (3) responsibility for money or securities, 0 to 4; (4) personal contacts with public, 0 or 1; (5) sex (weighed if man is required), 0 or 1; (6) minimum age at which candidates are ordinarily considered for the position, 1 to 10; (7) minimum general education necessary, 1 to 5; (8) special training courses necessary, 0 or more (rarely over 4 or 5); (9) previous experience demanded, 0 to 7; (10) personal qualities demanded (appearance, vitality, courtesy, perseverance, judgment, adaptability, initiative, directing ability, each in specified degree), 0 to 8; (11) minimum degree of general intelligence necessary, 2 to 5. Carefully formulated definitions made the assignment of weights quite simple and precise. The sum of the weights is the "grade index," and expresses the relative importance of the job. In positions below official rank in one institution it ranges from 7 to 44 points. Graphic comparison of the importance of jobs with salaries now paid can readily be made, and abnormally high or low salaries noted.

Critical testing of the method and results by every available criterion indicates that grade indexes assigned with the aid of this scale are much more accurate than the judgments of any individual or group of individuals without some such device. Although designed specifically for large banking institutions, it seems probable that the method can be adapted to other lines of business as well.

The Magster. LILLIAN MOLLER GILBRETH, Frank B. Gilbreth, Inc.

In determining *what* is to be taught, we encounter the problem of *who* can demonstrate the *what* in *The One Best Way*. To solve this we adopted the motion picture camera, photographing time and motion simultaneously. It was a great step in advance when we produced and used the first slowed-down pictures of the superexpert. We next used a device that permitted viewing this same superexpert in "still" pictures, giving a similar effect to snapshots. We then could leisurely examine each frame and the opportunities and results were infinitely beyond those with slowed-down motions. There was, however, a peculiar effect resulting from viewing the individual pictures as still pictures. The individual picture being looked at seemed

to blot out of the memory the impression of paths of motions that preceded or followed the pictures being looked at, regardless of how many times the film had been run and observed. It became apparent that there was a great need for some method of showing a recapitulation of the complete motion. This need was finally met by perfecting the chronocyclegraph, which gave a complete recapitulation of the relative time, exact time, relative speed, exact speed, path in three dimensions and direction of the motions. This satisfied the demand for the time being, simply because it opened new doors to information, but we still felt the inspiring need of stereoscopic moving pictures, so that we could see each one of the stilled pictures in three dimensions. This need was met, and resulted in another advance, for we could then build up synthesized chronocyclegraphs from the stereoscopic pictures without the lights on the hands, as with our former chronocyclegraphs.

With the stereoscopic stilled pictures of the moving pictures we again found a new need, that of seeing several pictures simultaneously for comparison, in order to see how the motions occurred, and the records of elements of behavior before and after the picture being minutely examined. This led to the design, construction and use of the Magster, a device equipped with wide angle stereoscopic lenses, which permit viewing as many as a dozen pictures without any movement of either head or pictures. This device enables the user to see in a leisurely manner all the details of the phenomena of precious skill, automaticity, comparative lag and relativity of simultaneity of the anatomical members and other elements of behavior, of the superskilled and the champion.

The Problem of Vocational Prognosis of College Students. EDWARD S. JONES, Oberlin College.

A thorough knowledge of the fitness of college graduates for their various vocations is the safest preliminary for a program of vocational and educational advice. Two years after graduation at least one out of five college men is probably inadequately started professionally and feels thoroughly at sea as to what he wants to do. Many such individuals are of superior ability. Prognosis of success may depend upon at least four types of criteria capable of objective treatment, each with peculiar values and defects: performance in school subjects, scores in mental tests, indications of prominence and activity in student interests, and estimates by professors or associates in various intellectual and social traits.

The recording and careful balancing of such criteria is the duty of college administrators. A rigid utilization of the multiple correlation method has its limitations. In the case of social qualities there is not only the "halo" effect, but also the tendency on the part of judges of character to use various adjectives or to refer to incidents which more fittingly describe an individual than is possible with a specific and limited list of prearranged traits. Certain odd, or irregular, patterns of qualities may take precedence over combinations which are uniformly high in all measurable respects. Success in business or social administration probably involves a distinctly different pattern than that necessary for high school teaching. It should soon be possible to advise students in the early years of college training towards or against certain prevocational courses or to arouse in them definite social attitudes or working methods.

EXPERIMENTAL PSYCHOLOGY

WEDNESDAY, DECEMBER 27, 3 P. M.

Color Preference and the Munsell System. DANIEL STARCH,
Harvard University.

The purpose of this investigation was to determine to what extent the selection and combination of colors according to the Munsell system is in accord with the actual preference of various classes of persons. Five sets of colored papers were used. Each set was composed of ten samples of colors, either single or in combinations of two or more colors. These sets of colors consisted in part of plain pieces of colored paper and in part of advertisements in which various colors were used.

The experiment consisted in determining the relative agreeableness of the colors in the various sets. The tests were carried out with four groups of persons: 18 business men, 15 graduate students (men), 25 women (not students), and 25 commercial artists. The colors and their combinations were then analyzed according to the Munsell notation.

The results showed (1) that the complementary color combinations were most highly preferred, with the exception that the preferences for certain pairs of colors which were not completely complementary, were affected by the agreeableness or disagreeableness of single colors constituting the combination; (2) that the commercial artists agreed no more closely among themselves than did the persons

in the other groups; and (3) that the preferences of the commercial artists did not agree as closely with the preferences of nonartists as various groups of the latter agreed with one another.

The Effect of Colors. H. S. LANGFELD, Harvard University.

Most experimenters upon colors, whether they are interested in the affective value, the esthetic choice or the accompanying mood, will undoubtedly agree that the results obtained are very far from satisfactory owing to the very decided individual differences. There are a great many factors which influence the findings. Some of them, such as brightness and saturation, can be standardized, but individual experiences, physical conditions, momentary moods, etc., which are strong elements in determining the reactions to colors, are beyond the control of the experimenter. The most, therefore, that can be expected are general tendencies with wide distributions. Many of the individual reactions will be found to be embarrassingly contradictory, for example, a color will appear warm to one individual and cold to another. That these general tendencies, however, are due to something fundamental in experience rather than to chance is indicated by a certain agreement among young children.

This paper will mention chiefly certain experimental results to show that, contrary to statements in the literature, children at an early age give evidence of a truly esthetic reaction. Not only do they frequently appreciate the artistic elements of pictures, but they also show a certain consistency in the induced moods and attitudes. The paper will further describe a group experiment on moods and symbolic associations aroused by colors, which was tried on a large number of adults. Thirty different colors were presented successively and the subjects were instructed to select from a printed list the words which best described the characteristics of the colors. The experiment was devised to determine the best use of colors in the industrial field. Due to certain conditions of the practical situation, the arrangement of the experiment was not ideal, but the results seem sufficiently suggestive to be of value for the purpose intended as well as encouraging for further investigations.

The Theory of Flicker Photometry. C. E. FERREE, Bryn Mawr College.

Visual sensation rises to its maximum through an interval of time and then dies away because of a progressive loss of sensitivity or adaptation of the eye. Moreover, the rate of rise and fall varies

both with the wave length and intensity of light. The eye when used as a balancing instrument may be likened roughly to weighing scales which never quite attain to stability or constancy of balance when the objects or commodities to be balanced are not of the same kind. The results obtained depend on how long they remain on the scales, the stability increasing, however, with increase of time beyond a certain value, the time required for the instrument to give its maximum response. Moreover, to make the situation still more complicated the effect on the results of the balance varies with the amount of the commodity present.

The cause of the disagreement of the results obtained by flicker and equality of brightness photometry may be looked for in these peculiarities of the eye as a light balance. Disagreement would not be expected if the intensity of the brightness sensation were a regular function of but one variable, intensity of light, instead of a very irregular function of three interacting variables: wave length and intensity of light and time of action on the eye. Length of exposure is an important factor when the lights to be balanced differ in composition. For the purpose of detecting small differences of brightness in the successive sensations aroused, the phenomenon of flicker is excellent; but trouble arises when we try to say that lights which arouse sensations of equal brightness for one length of exposure of the eye will arouse sensations of equal brightness for any length of exposure. The equality of brightness and flicker methods agree within the limits of sensitivity of the judgment when the eye is given the same length of exposure by both methods; they do not agree when different exposures are used. Nor does the equality of brightness method agree with itself in any two determinations if in the one the eye is underexposed to the lights compared and in the other fully exposed as it is in the accustomed use of this method.

The question as to whether or not the disagreement between equality of brightness and flicker ratings is large enough to be of practical importance in commercial illuminants does not come within the scope of this paper.

Comparative Studies of Equality of Brightness and Flicker Photometry with Special Reference to the Lag of Visual Sensation.
GERTRUDE RAND, Bryn Mawr College.

This study covers the following points:

(1) Four spectrum lights: 675, 579, 515 and 466 millimicrons were photometered against a 32 c.p., 4.85 w.p.c. carbon lamp by the

flicker and equality of brightness methods at 12.5, 25 and 50 m.c. The rise of sensation in just noticeably different steps of brightness was determined for each of these lights and intensities with the same observer and state of adaptation of the eye and as far as possible the same apparatus. A comparison was made of the direction and amount of deviation of the flicker from the equality of brightness results with the difference in height to which the sensations are allowed to rise during the individual exposures used in the method of flicker.

(2) The effect of variation of intensity was determined. Seven intensities were used, three of which permit of comparison with the rise of sensation curves. As might be expected from a study of these curves, one intensity was found for each pair of lights at which agreement occurs with the most sensitive speed of rotation of the flicker disc. Above and below this intensity came overestimation or underestimation, depending on the color selected. These most favorable intensities were widely separated for the four pairs of lights, and the percentage disagreement at each of these intensities for the three remaining pairs was quite large.

(3) The effect of speed of rotation of the flicker disc on the type and amount of the disagreement was determined. A very considerable effect was found, varying with the intensity of the light employed. The effect was smallest at the intensity at which agreement occurred for the most sensitive flicker speed.

(4) Each pair of lights at three intensities was rated by the equality of brightness method, with a length of exposure equal to that of the individual exposures used in the method of flicker. Agreement with the method of flicker was obtained within the limits of sensitivity of the judgment, around 0.4 to 0.5 per cent for the flicker and 1.3 to 2.7 for the equality of brightness method. One important conclusion indicated by this result is that no differential summation effect is produced by the succession of exposures used in the method of flicker, *i.e.*, the difference in level to which two sensations rise in a single exposure is not decreased by a detectable amount in the succession of exposures.

Binaural Phenomena and the Possibility of Bone Transmission of Sound. F. C. DOCKERAY, Ohio Wesleyan University.

That the presentation of a certain vibration frequency simultaneously to each ear, but in different phase, influences the apparent localization of the resulting tone is generally recognized. Several

observers have also observed the presence of beats when two slightly different vibration frequencies were presented in a similar manner. Secondary maxima and a circular movement of the localized tone accompanying the beats have also been observed. The usual explanation of these phenomena is based upon the assumption that the vibration is transmitted through the head to the opposite ear and thus results in a change in intensity. Our experiments with thirty normal and two monaural subjects with simple vibrations of various frequency and amplitude led to the ears from soundproof compartments present data that can not be explained on the assumption of bone transmission. Characteristic differences in monaural and binaural phenomena have been observed that have been generally overlooked by advocates of the bone transmission hypothesis. Furthermore, no evidence of bone transmission under the conditions employed has been observed. Explanations of many of the phenomena can be made without bone transmission and without doing violence to the known facts of nerve functions.

MENTAL MEASUREMENTS

THURSDAY, DECEMBER 28, 9:30 A. M.

The Unreliability of the Difference between Intelligence and Educational Ratings. J. CROSBY CHAPMAN, Yale University.

With the entrance of "intelligence tests" and "school tests," it is a great temptation to measure "intelligence" and "school achievement," and then by the difference in standing to estimate the extent to which an individual is taking advantage of his school opportunity. The general idea is so attractive and the results, if true, so useful that psychologists and schoolmen have been captivated by the simplicity of a definite figure which promised to give such valuable information with regard to the pupil and the school. Provided sufficiently accurate differential instruments are available, no one doubts that the procedure is most useful, but in the absence of such instruments it is surprising to find the rigid manner in which the differences in intelligence level and school level, resulting from single tests of each, have been interpreted. The logical basis of such a procedure is examined. By a simple process of statistical analysis a formula has been derived to measure the extent to which our present instruments are adequate to measure this difference between mental and educational standing. Applying this formula to the usual run of

mental and school tests it is immediately apparent that the so-called mental educational differential index possesses almost no reliability whatsoever.

This disappointing result proves the futility of a great deal of superficially thorough and careful work that is being done in many laboratories and schools. It shows the necessity for careful statistical analysis of the groundwork of the testing movement. Apparently many claims made by authors and more by business houses cannot be justified at the more exacting bar of statistical truth.

Comparison of Two New Statistical Procedures for the Treatment of Fragmentary Data. LAURA M. CHASSELL, Ohio State University.

It is the purpose of this study to compare two new statistical methods for the treatment of fragmentary data—the one a rule of thumb, the other a rigorous statistical procedure. The first was devised in its essential features by Dr. E. L. Thorndike, and was developed by the writer. The second was devised and developed by Dr. T. L. Kelley. Either is adaptable to fragmentary data of the judgment type if the gaps in the data are due to lack of familiarity on the part of the judges with items to be rated. They have as their essential feature the determination of a score incorporating a separate weighting for fame and merit.

The data with reference to which the methods were developed were the ratings of 107 doctoral dissertations by ten judges. The fragmentary character of the data was due to the fact that only 332 of a possible 1070 ratings had been assigned.

The rule of thumb replaces each of the assigned scores by a modified value, which incorporates the original scores and a varying increment by means of which credit is given for each grade assigned; and then averages these weighted scores. The more refined procedure estimates the average score which would be assigned by an infinite number of judges, from the average of the scores actually assigned; and adds to this a constant weight for each score.

The ten series of ratings were divided into random halves; then final scores for the different dissertations were computed. The two series of measurements secured in the case of each of the two methods were correlated with six other series of data, and reliability coefficients were computed.

The results found are as follows: The correlation between the two methods is .95. The corresponding coefficients of correlation

are closely similar. The average correlations are almost identical, not differing by as much as .02. The difference is in favor of the first method. The reliability coefficient in the case of the first method is .58; and of the second, .53. These correlations are in striking contrast with the correlation between the two methods. Thus the two methods, though representative of different types of statistical procedure, are very much more alike than two measurements, based each upon five series of judgments, of the same group of items.

The Dimensions of the Intellect. TRUMAN L. KELLEY, Stanford University.

Many are using a general intelligence measure as sufficient to the understanding of widely diverse mental situations. Because the one-dimensional concept has been so fruitful, though apparently at times inadequate, I anticipate great serviceability in a two-dimensional concept, though I would, of course, welcome a higher dimensional hypothesis should it seem to be required. What, then, are the characteristics of a two-dimensional intellect?

From the standpoint of the "single-mental-factor" theory a person's score in an intellectual task can be set equal to $kG+S+C$; in which G is the amount of the general mental factor, S the amount of a factor specific to the particular task, C the amount due to chance, and k is some constant. The magnitudes G , S and C are uncorrelated. According to a theory of "two general factors" the score would equal k_1A+k_2B+S+C ; in which S and C are as before, A is the amount of the first factor, B of the second, and k_1 and k_2 are constants for the task in question, but change as other intellectual tasks are chosen. The two factors A and B may or may not be correlated. If all intellectual life can be thus measured by the factors A and B , and further, if the regression between A and B becomes linear when the distributions of A and B are each made normal, then certain important relations between all intellectual functions exist. Stated without proof these are:

- (1) All intellectual functions may be expressed as normal distributions having linear regression lines with these two functions A and B .

- (2) Any two nonidentical intellectual functions, together with the correlation between them, are sufficient to define and measure all other intellectual functions.

- (3) For each intellectual function there must exist a second,

having zero correlation with the first, and the discovery and utilization of such a pair would lead to a greater simplicity in interpretation than that resulting from the use of two correlated measures.

(4) Conversely, if two normal uncorrelated intellectual functions cannot be found, then intellectual life (for the group in question) cannot be represented by two normal linearly related functions.

In conclusion I will hazard the prediction that the important future advances in the experimental treatment of individual differences will lie in the discovery of mental functions which are incapable of representation by normal distributions and rectilinear regressions, or, failing that, by the discovery of invariants in mental relationships, using the term invariant in the mathematical sense.

COMPARATIVE PSYCHOLOGY

THURSDAY, DECEMBER 28, 3:30 P. M.

Some Observations and Experiments on the Intelligence of Apes, "Sokker," Chimpanzee, and Ourang "Rufus," at National Zoo, Washington. WM. T. SHEPHERD, Columbia University School.

Purposes: I. To test for (1) ideas; (2) imitation; (3) reasoning. II. To ascertain if their intelligence is equal to or greater than the intelligence of other monkeys. III. To verify conclusions reached by writer in experiments and observations on other apes, "Peter" and "Consul," previously reported. IV. To test their intelligence as compared with dogs and cats in similar experiments made by writer and reported some years ago.

Experiments: I. Reasoning—"Sokker"; food suspended by string in front of cage, just out of reach, with stick run through fruit (end of stick within reach), pointed to cage. Results: Succeeded in five seconds, first trial; in four seconds, second trial. "Rufus" did act in eight and six seconds. II. Ideation—"Sokker"; placed food on end of board pointed away from cage, the other end within reach. Results: Pulled board endwise to him and secured food. Rufus also. III. Imitation—T—rake, within reach, to pull in food out of reach. Negative results. More trials might have succeeded.

Results and Conclusions (so far as warranted by few experiments): I. Apes are superior to the lower monkeys. II. Are superior in intelligence to dogs and cats. III. Observations verified conclusions in observations of the other apes. That is: (a) Their

superior motor equipment accounts in part for superiority; (b) biped position, also, part of superiority; (c) but they are, however, superior to all other subhumans.

Blood, the Color Red, and the Anger of Cattle. G. M. STRATTON,
University of California.

In reports from men experienced with cattle in California, there is a nearly unanimous testimony that the shed blood of another animal is a powerful excitant of cattle of both sexes. It causes in the herd a bellowing, a pawing of the ground, and wild running about, with resultant collision and fighting. The testimony leaves one in doubt, however, (a) whether the reaction is a general excitement or is a more specific emotion, such as fear or anger; (b) whether it arises from the color or from the odor of the blood, or from both or neither; and (c) whether the response differs markedly with the kind of animal which shed the blood.

Further reports may be expected to remove some of these doubts. As to the color red, by itself, it should be said that the popular opinion that red produces anger in cattle, and especially in bulls, is not held by most of the many cattlemen who have given to the writer their judgment upon this. Some share the popular belief, but very few of these offer any effective evidence in support of their opinion.

Experiments will have to be one's main resource. Some with blood are now in preparation. Others with color have already been carried out. Experiments with bulls, cows, and calves indicate that the popular belief as to red is wholly mistaken. In the reaction of these animals to colored cloths there seems no effect which need be attributed to the color itself; the potent factors seem to be the general strangeness of the object, its brightness, and its movement. More attention was paid to white than to red; about as much attention went to green as to red; a sudden flutter of any color is mildly startling. But apart from persons, none of these things seemed to cause anything distantly suggesting anger. It is probable that the popular belief arises from the fact that cattle, and particularly bulls, have attacked persons displaying red, when the cause of the attack lay in the behavior of the person, in his strangeness, or in other factors apart from the color itself. The human knowledge that red is the color of blood, and that blood is exciting, doubtless has helped the fallacy.

The Measurement of Instincts. JOHN J. B. MORGAN, State University of Iowa.

Experiments have been conducted with this thesis: The amount of inhibition necessary to overcome any tendency may be used as a measure of the strength of that tendency. This holds whether the bond involved is due to hereditary determiners or is formed through experience in the life of the individual, either pre- or post-natal.

If this thesis is true it should be possible to evaluate the strength of all tendencies, including those classified as instincts, in terms of the amount of inhibition necessary to prevent the manifestation of the tendency.

In order to develop this program experiments have been performed upon white rats to inhibit any manifestation of heterosexual conduct. As soon as weaned the sexes were separated and permitted to come together only under experimental conditions and were punished severely for any bodily contact of one sex by the other. This punishment was accomplished in two ways: (1) They were placed in adjoining living compartments the wall between which contained holes through which they could project their noses. If a male in one cage touched the nose of a female in the other, or *vice versa*, they automatically received a severe electric shock. (2) Daily they were placed by pairs in a single cage so that there was no physical means to prevent bodily contact but they were punished severely for all such contact.

By means of these two sets of punishment they learned to avoid the other sex. After a prolonged period of such training they were placed in living cages with no restrictions. After all this preliminary training we have been able to produce a lasting inhibition of the sex impulse in only one female. We have shown that in some instances the reproductive impulse can be repressed, but that it is very difficult. It is likely that all other tendencies can be repressed and these can be classified according to their strength to resist inhibitory training.

White rats are being used merely to develop experimental technique. When this is done the work will be continued upon dogs. This should enable us later to carry the same procedure over to humans with the restriction that experimentation in this field will have to be limited to the type which will in the end prove beneficial to the person undergoing experimentation.

The practical importance of these investigations for educators, psychological clinics and habit clinics of all types is very far-reaching.

The Anti-Instinct Fallacy. WESLEY RAYMOND WELLS, Lake Forest College.

An aggressive campaign is being carried on at the present time against the instinct theory by a considerable number of psychologists, who largely agree upon what they consider to be the fundamental error in the theory of instinct. This error, according to these deniers of instinct, is the failure to observe that all action patterns of the mature person are *acquired*, either after birth or at least after the fertilized ovum has begun its development. Therefore, these critics assert, all action patterns should be looked upon as habits, not instincts, since the term "instinct" properly refers to *inherited* forms of response. There is assumed in this position of the deniers of instinct the thought that whatever is inherited must be due wholly to germinal factors and cannot be acquired, that is, cannot be subject to a developmental history under environmental influences. It is this assumption, arising from the ignoring of biological facts, which constitutes the fundamental fallacy in the writings of the majority of the anti-instinct psychologists.

The general agreement among several critics of instinct in the contention that the so-called instincts are not inherited action patterns, inasmuch as their developmental history can be traced, may be shown (is shown in the paper) by reference to articles by such writers as Bernard, Allport, Kuo, Ayres, and Kantor. Such critics deserve commendation for having emphasized the fact that all action patterns do have a developmental history, but they have grasped but half the truth through failure to see that inherited structures of all kinds, whether of fur and feathers, bone and muscle, or nervous tissue (including synaptical connections), have a developmental history and that they are all acquired, being due in part to the influence of biologically normal environmental conditions. (They are not acquired in the Lamarckian sense, but the deniers of instinct do not say or imply this.) "Inherited" means "acquired in individual development as a result of germinal factors, or determiners, plus *normal* environmental factors." Noninherited structures are those acquired under the influence of *abnormal* environmental conditions, and without direct germinal sources. The popular contrast between "inherited" and "acquired," which would make them mutually exclusive, is entirely false; and yet this popular contrast has been accepted uncritically by many writers on instinct. Numerous experiments in genetics (referred to in the paper) have proved the influence of the environment in the case of heritable traits.

ADDRESS OF THE PRESIDENT
KNIGHT DUNLAP

THE JOHNS HOPKINS UNIVERSITY

"THE FOUNDATIONS OF SOCIAL PSYCHOLOGY"

THURSDAY, DECEMBER 28, 8 P. M.

MENTAL MEASUREMENTS

FRIDAY, DECEMBER 29, 9:30 A. M.

Intelligence Tests Correlated with Criteria. A. M. JORDAN, University of Arkansas.

The present investigation was undertaken to discover the relationships between four group tests of intelligence (Army Alpha, Terman, Miller, Otis) and various criteria. Sixty-four pupils of high school age were tested with these tests, the Stanford-Binet, and with an ideational learning test devised by the author. Estimates of the pupils' intelligence were made by four critic teachers and the pupils' ages were recorded. With these four criteria were correlated each of the four group tests and each element of each. The factor of age was eliminated by partial correlation.

Unusual care was exercised in obtaining the ratings for intelligence. The definition of intelligence was handed to each teacher in writing together with the list of names to be judged. The ratings were made from zero to ten and the limits as well as the middle position defined. Moreover, each teacher was asked to rate only those pupils whom he knew well. The ideational learning test consisted in placing between given numbers the letter which occurred there in the alphabet. The instructions were to image all the letters in the alphabet each with a number, thus, $a=1$, $b=2$, etc., and to imagine the letter occurring between the eighth and tenth letter, etc. There were twelve practice periods of three minutes each.

The results in most cases were consistent and clear cut. Negative correlations ranging from about zero to $-.45$ were obtained in every case save one with age. The effect of correcting for the age factor was, therefore, to reduce the correlations with the other criteria from .02 to .05. Correlations with mental age varied from .24 (Alpha-1) to .69 (Alpha total). With this factor Miller (.53)

ranked lowest and Alpha (.69) highest. With estimated intelligence the r 's varied from .24 (Alpha—1) to .73 (Otis total); while with the learning test the coefficients were lower: —.12 (Terman—8) to .31 (Terman—5). About 33 per cent of the pupils in the highest third maintained their corresponding positions in the other tests. And finally when r is assumed to be perfect and the scores transmuted from one test to another by the regression equation the average difference between these scores and the actual scores is about 12.

A Comparison of the Intelligence of Mexican, Full and Mixed Blood Children. THOMAS R. GARTH, University of Denver.

Problem: To ascertain if there are differences in the intelligence of Indians of different blood stocks.

Materials: The National Intelligence Tests.

Subjects: 126 Mixed Bloods, 307 Mexicans, 249 Plains and Forest Indians, 176 Pueblo Indians, 85 Navajo and Apache Indians. All of the last three blood groups were full bloods.

Results: According to average score and median score as well as to the graphic representation of the percentiles the order of intelligence is in the following sequence: Most intelligent, Mixed Bloods; 2nd, Mexicans; 3rd, Plains and Forest Indians; 4th, Pueblo Indians; 5th, Navajo and Apache Indians. The anthropologist's claim that nomadic peoples are more intelligent than sedentary peoples is borne out by the fact that the Plains Indians excel the Pueblo Indians.

An Intelligence Test for Children from Three to Six. GRACE E. BIRD, R. I. State College and R. I. College of Education.

This test, which is about to be published, is the result of many years observation and experimentation by Professor Clara E. Craig and the writer. It was derived to meet a need and demand on the part of our teachers for an instrument to measure the intelligence of children between the ages of three and six, three being the age at which pupils may enter our Children's School.

The test consists of two forms of approximately equal difficulty. It is composed entirely of pictures of objects involving common properties and qualities of the environment, a few omissions, ordinary family relationships, every day activities, social groupings, and numbers from one to ten, combined with similarities and differences in groups of simple geometric figures. In short, the

achievements required involve such judgments as the average child from three to six is competent to make.

Some of the characteristic features of the test are as follows: It is adapted to a very early age. It is sufficiently brief, easily administered and scored so as to reduce the probability of inaccuracy on the part of the examiner to a minimum. It can be employed as an individual test or as a group test for as many as five. It calls for no time limit. It aims to be so thoroughly objective as to eliminate the element of self-consciousness on the part of the pupil. Its diagnostic value is increased by the interest it arouses on the part of young children. The material has been found to be well within the experience of the average child. It involves no distortions or grotesque and unnatural situations. The examiner identifies most of the pictures for the child, thus reducing his achievement to the definite problem required. The only response called for on the part of the child is a simple mark to be placed on the picture in question, thus making no demand on his ability to draw. The original pictures were drawn by an artist who understands the juvenile point of view. Though the material presents an ascending scale of achievement, it is not all arranged in order of difficulty.

The test is now in the process of standardization, the present norms being based upon the achievement of several hundred children.

Results of Experiments in a Pre-School Psychological Laboratory.

BIRD T. BALDWIN and LORLE I. STECHER, Iowa Child Welfare Research Station.

In October 1921 the Child Welfare Research Station at the State University of Iowa opened a laboratory for psychological experiments with children of an age that has been little studied because of the difficulty of providing controlled conditions. Twenty-four normal and superior children between the ages of two and four years from faculty and town families have been in regular daily attendance for nine months during 1921-22. The number has been increased to 32 this year with an additional group of 24 children from four to five years of age.

The laboratory consists of a new building with group and examination rooms. Five graduate assistants, registered for higher degrees in the Research Station, help with the experimental work and one directs the simple and flexible schedule of stories, rhythmic exercises and occupational projects. Although the laboratory is organ-

ized specifically for psychological experiments, the educational work has demonstrated the possibility of coöperative enterprises among these young children, and has opened up the way for a scientific study of the development of social attitudes.

A series of 22 psychological experiments has proved that under good laboratory conditions the irregularity of performance or instability of attention generally attributed to young children is not sufficient to invalidate psychological experiments. This series of psychological examinations consisted of repeated intelligence ratings, performance tests, observations on motor control, rhythm, perception of form, color, weight and number, together with some complex memory and association tests. Intercorrelations for a selected group of tests were computed.

A similar group of children in a State Orphanage is being used to check the results of last year's and this year's work, and to analyze further the development of various intellectual and motor traits. The research station is also beginning psychological work on infants and children from birth to two years of age.

Measuring Interests Objectively. HAROLD E. BURTT, Ohio State University.

An attempt was made to measure objectively factors such as interest in one's work and industry in applying one's self thereto. A few novel principles which have at least a hint of empirical justification are outlined in the hope that they may be suggestive to others working on similar problems. The data were obtained in connection with a more extensive vocational study of agricultural engineering students and were evaluated by correlation with instructors' estimates as to "interest and industry."

In crossing out irrelevant words in an uninteresting text and in one dealing with zeal, success, etc., there was some evidence that the individual who was industrious and eager to advance became interested in the latter text and overlooked relatively more of the irrelevant words.

In a test of auditory memory by the method of word pairs some of which were normal and some related to the vocation in question, it appeared that the subjects actually interested in agricultural engineering made a relatively higher score on the latter kind of pairs. In the same test the relative score on pairs dealing with zeal, success, etc., did not correlate with estimated interest and industry.

An information test, in conventional form, dealing with facts in agricultural engineering showed no correlation with estimated interest although an appreciable correlation with estimated ability.

None of the regressions were to any great extent nonlinear.

The Development of Interests in Children and Adolescents. LUELLA COLE PRESSEY, Ohio State University.

The study involves results from an "Interest Questionnaire" from other similar materials yielding approximately 2000 responses concerning the interests and ambitions of pupils from the sixth grade through college; results have also been obtained from juvenile delinquents and from the inmates of a state reformatory.

From these results an intensive study has been made of changes in interests with age. Sex differences have also been studied and individual peculiarities in responses have been noted. The study has resulted in an "Interest Scale."

The first form of this scale, constructed by selecting and combining those items differential of maturity from the entire examination, is presented, and first results offered. The scale is intended for use as a clinical instrument—though it may be given as a group test—to enable the examiner to find out something regarding the interests of the children sent to him for study. It is hoped that the scale will present a simple, compact means by which interests and ambitions may be investigated and comparison made with large groups of normal children. The scheme is, thus, much like that of the Binet Scale in the field of intellectual development. The scale may be still in tentative form, but it should be of decided suggestive value to those who are dealing with the study of atypical children.

CLINICAL PSYCHOLOGY

FRIDAY, DECEMBER 29, 10:30 A. M.

The Determination of the "Major Causes" of Specialized Behavior.

HERBERT A. TOOPS, Institute of Educational Research, Teachers College.

The psychologist, interested in predicting future behavior of persons, considers them as individuals equipped with varying amounts of specialized traits. He views the complex behavior of an individual as due to the joint effect of many intercorrelated factors. This point

of view is contrasted with the actuarial point of view, wherein the individual is considered as but one sampling taken from the mass of humanity, and where, once the group to which the individual belongs is known, the behavior is considered as dependent upon "chance." A comparison of the two points of view, as applied to the specific problem of predicating the chances of death, illustrates the principles involved.

With adequate quantitative measures of the specialized behavior available for an experimental group, it is possible to make predictions of future individual specialized behavior. Thus, by merely knowing the simple law of the dependence of the age at death of the presidents upon the age at inauguration, we may make a prediction of the probable age at death of any individual living president. The resulting prediction merely gives the age—from which can be calculated the calendar year—at which the president considered will have one chance in two of still being alive; it does not predict invariably, but only with a determinable margin of error. This margin of error depends upon the magnitude of the multiple correlation coefficient, being small when the coefficient is large and *vice versa*. With a maximum multiple correlation coefficient the margin of error is a minimum. When the margin of error becomes zero, the specialized behavior is fully causated and can be perfectly predicted. However, in the social sciences, causated behavior in the above sense is unknown, but it can be roughly approximated.

A technique for determining the *n* most important "causative" factors of specialized behavior has been devised. The formulæ yield an approximate *maximum correlation coefficient from a minimum number* of traits. The equations, which are readily solved by form charts, require the solution of but a few of the possible intercorrelation coefficients. Thus the "major causes" of specialized behavior are efficiently determined.

The field of application for the method is found in studies having to do with heredity, delinquency, educational and vocational guidance, the prediction of ultimate development through physiological growth or through practice, and the various problems of social amelioration and control.

An Unusual Case of Sensory Discrimination and Synaesthesia.

ROBERT H. GAULT, Northwestern University.

This paper is based upon a study, during two weeks, of W. H., a seventeen-year-old girl who is alleged to be deaf and blind and

to be able to distinguish colors of certain materials by the sense of smell, and to interpret the human voice by vibrations conducted to her finger tips.

Our investigation of the case as to discrimination of colors is not concerned with the question whether she is physiologically blind nor even primarily whether she is psychically blind, but with the questions, (1) whether she actually made the discriminations under rigid test conditions, and (2) what theoretical considerations appear to be justified by the phenomena.

A bandage was used, the efficacy of which has been demonstrated upon fifty students at Northwestern University. Furthermore, tests with other bandages, through which the lighted window could be easily distinguished, made it impossible for these students to distinguish color.

The bandage used upon W. H. consisted of a pair of automobile goggles lined with black paper, stuffed with cotton wool and bound to the head with stiff elastic. Furthermore, a strip of adhesive plaster was used to hold the lower edge of the mass of cotton wool firmly to the face and a bent glass tube was inserted in one nostril. The experimenter himself held Holmgren worsteds with a pair of tweezers against the outer end of the tube four inches in front of the point of the subject's nose. She correctly named the color of each of 25 yarns in succession.

One normal subject has since been found who in 45 out of 50 cases, correctly reported "same" or "different" after having smelled at pairs of the same set of yarns as those used in the tests upon W. H. This lends color to the hypothesis that one might learn to make the distinctions that W. H. appears to make.

There is, further, the hypothesis of smell-color synaesthesia, which it has been impossible to test.

The usual laboratory tests for tactual and thermal sensitivity upon the cheeks and hands reveal an abnormally low threshold, so low for touch that the experimenter has not been able to assign it an absolute value. The subject promptly recognizes and locates on the palms of the hands the heat radiated from an Ever-ready flash light when the lens is at a distance of two inches from the skin.

Stammering vs. Normal Speech. SAMUEL D. ROBBINS, Boston Stammerers' Institute.

The vocalization recorder makes it possible to measure accurately, in both normal speakers and stammerers, the length of each vowel,

of each syllable spoken, and of each pause between syllables, also the proportional part of each expiration period utilized in vocalization.

This recorder consists of a glass resonance chamber shaped like a lamp chimney with the smaller end tapering down to an inside diameter of 0.3 inches. A soft rubber ring, having an inside diameter of 1.75 inches and manufactured to go over a telephone receiver, fits over the larger end of the resonance chamber and keeps the vibrating column of air from escaping at the corners of the mouth while the subject is speaking. This resonance chamber is connected through a short rubber tube with a tambour, 0.62 inches in inside diameter, having a membrane of gold-beater's skin which is held in place by a tightly fitting brass ring. A recording lever with a long celluloid tip reproduces the vibrations of this membrane, magnified 37 times, on the smoked drum of a Zimmerman kymograph which moves at the rate of five inches per second. A small electromagnet recorder, connected in series with a tuning fork which interrupts the circuit fifty times every second, traces a line just above the vocalization line. A reference point on this time line is denoted by a break in the line made by short circuiting the current around the tuning fork.

The results indicate that the long vowels and diphthongs of normal speakers are half as long again as their short vowels and are about the same as the corresponding vowels made by slight stammerers. Bad stammerers hold all of their vowels unduly.

The percentage of the expiration period utilized in vocalization is a third less for bad stammerers than for slight stammerers and normal speakers. Bad stammerers read an average of but half as many words per minute as normal speakers and slight stammerers do; they also pause three times as long between words and syllables, and hold the average syllable half as long again.

The Sucking Habit in Childhood and Personality. C. MACFIE CAMPBELL, Boston Psychopathic Hospital.

The brief discussion of a child presenting a familiar symptom. The child is an inveterate thumb-sucker with associated movements involving the rectum and genitalia. The influence of the latter habits on the evolution of the personality has been emphasized by Freud; thumb-sucking and its varieties have been described in detail by Lindner. It is interesting to note the differences in the individual endowment of children; in some children such habits are transitory, easily repressed, in others they are tenacious, difficult to repress, and

seem to be a source of considerable satisfaction. The associated movements are sometimes quite complicated and stereotyped.

It is obvious that, where these movements conflict with social requirements, and where they are a source of much satisfaction, they will prove a difficulty in the way of development; they may be superseded by less obvious modes of attaining a similar satisfaction, or, on the other hand, they may elicit a rather exaggerated compensatory reaction. Teachers and psychologists interested in children probably have frequent opportunities for studying such an evolution, but the literature contains few reports.

A Clinical Psychology of Pre-school Children. ARNOLD GESELL, Yale University.

The present status of psychometric and psychoclinical study of children of preschool age. The paucity and incompleteness of preschool norms of mental development. Historical and other reasons for the emphasis of the school age. Considerations which warrant the development of a clinical psychology with special reference to preschool children. (a) The basic developmental significance of the pre-school years. (b) The tendency toward a consecutive health supervision of all children from early infancy. (c) The growing movement both here and abroad to bring the pre-school period under educational as well as public health control. (d) The importance of administrative problems relating to school entrance, the kindergarten, nursery establishments and child welfare agencies. (e) The need of a normative infant psychology for pediatrics and mental hygiene.

A general statement of the investigations of developmental norms of pre-school children being made at the Yale Psychoclinic. A brief preliminary report of methods and results illustrated with action photographs of six and nine months old infants in typical behavior situations. A summary of the performance reactions of 50 babies just nine months of age. Lantern slides and tables showing responses of subjects in ring grasping, persistent reaching, acceptance of third object, looking for fallen object, fine prehension, unwrapping paper, and cup and cube problem.

Some limitations and possibilities of a clinical psychology of pre-school children.

CLINICAL PSYCHOLOGY

FRIDAY, DECEMBER 29, 2:30 P. M.

Methods and Results in the Experimental Investigation of Attitudes and Complexes. F. A. C. PERRIN, University of Texas.

By attitude is meant any generalized mode of reacting to situations or to people; by complex is meant a system of ideas (topic) associated with personal embarrassment, fear, worry, or disgust. Three methods of investigating both are reported:

(I) The free association test was used for the diagnosis of complexes. Fifty advanced students acting as subjects were given individually a list of 40 stimulus words. Full data were recorded regarding (a) response time, (b) response words, (c) expressive behavior of subjects (blushing, etc.), (d) subjects' explanations of responses. Criteria for diagnosis of complexes were (a) short response intervals, (b) long response intervals, (c) identification by subjects of their own complexes, (d) judgment of experimenter, based on expressive behavior, but disregarding reaction time.

Forty-five per cent of complexes identified by subjects were judged to be actual complexes by experimenter; but 96 per cent of words judged to be complexes by experimenter showed either a long or short reaction time.

The total number of identified complexes was 297; number of cases in which experimenter agreed with subjects was 145—leaving 152 words identified as complexes by subjects but not so judged by experimenter. But of this 152, 50 per cent showed either long or short reaction times, thus supporting testimony of subjects as opposed to judgment of experimenter.

About 150 words were not identified, but were regarded by experimenter as complex words; about the same number, as just said, were identified but not accepted by experimenter. After ranking both lists in descending order of frequency of report it was found that the words most frequently repeated in the two lists showed a high correlation. This means that some words are better complex words than others. In general, words identified by subjects but not judged as complexes by experimenter were ambiguous in definition, or mild complex words; words judged as complexes by experimenter but not identified were words of local significance, quite personal, and probably defense or cover reactions.

(II) The results of a self-analysis chart for attitudes and com-

plexes and (III) an order of merit list of moral judgments were correlated with each other and with the experimenter's judgments, using the same subjects. Fairly low correlations were found between order of unconventionality in moral opinion and tendency to show sex complexes; between order of unconventionality and total number of complexes. Positive correlations hold between general attitudes towards life (cynicism, etc.) and other attitudes—sex, religious, social, etc.

The Dream as a Reconditioning Process. JOHN E. ANDERSON, Yale University.

A conditioned fear reaction of high intensity and great specificity was established in an infant one year and nine months old, the stimulus being a Scotch terrier. After an eleven months interval during which no reaction appeared, restimulation by a similar dog brought out a very mild reaction, which was easily inhibited by counter stimulation (verbal reassurance). During the following night a very intense fear reaction, in the form of a nightmare, appeared. This dream functioned as a reconditioning process for subsequently the fear reactions were very intense and were elicitable by all types of dogs and to some extent by other animals. Apparently the dream was not an outlet which decreased the affect but a trauma which increased it. The significance of the case in relation to existing theory is discussed.

The Pathogenesis of Mental Inferiority and the Prevention of Degeneracy. J. E. WALLACE WALLIN, Miami University.

On the bases: (1) of a 12-year study of the case histories of about 3500 noninstitutional juveniles of various grades of intelligence examined by me in three clinics, 872 of which were subjected to detailed analysis; (2) of first-hand contact with thousands of the parents of these cases (only 30 or 40 of whom could be classed as feeble-minded); (3) of the determination of the number of siblings sent during 12.5 years to public schools for mental defectives (less than 8 per cent), and of the number of such pupils later committed to an institution for the feeble-minded (only about 20 in 12.5 years), and the estimated number of mental defectives at large in the state; and (4) of the conclusive implications of the experimental data on the moot question of the modifiability of the germ plasm by blastophthoric substances:

The following conclusions, among others, were reached: 1. A clear-cut, unambiguous pathogeny could be established with reasonable certainty in only a minority of cases (26.6 per cent of the 872). 2. Most cases of feeble-mindedness could not be traced to insanity, feeble-mindedness or epilepsy, the alleged triad par excellence of "neuropathic inheritance," and alleged to be the chief, or even the only, cause of feeble-mindedness. 3. Feeble-mindedness and subnormality may be produced by a variety of factors, environmental or hereditary, acting separately, or concurrently. It is not invariably due to dysgenic heredity, nor to the absence of a unit trait or Mendelian determiner. 4. In particular, many destructive agencies, especially various kinds of toxins and toxemias, and deficiency of salts and vitamins, may injure the brain of the embryo or foetus, or of the young child, and the parental germ plasm through the parental soma, and the germinal modifications thus produced may be transmitted to the progeny through one or more generations. 5. The reduction or eradication of feeble-mindedness or degeneracy cannot be wholly accomplished through colonization, sterilization or the prevention of the mating of the feeble-minded or degenerate. Continuous effort must also be made maximally to prevent the toxication of the parental germ plasm of successive generations by preventing the invasion of the system by blastophthoric substances, and by detoxicating organisms already suffering from poisons and toxemias. We must also prevent injuries from mechanical impact, lesions, diseases and toxins to the child's nervous system before and after birth. On the positive side, the mental and physical powers must be exercised and developed by the application of the best that a comprehensive science of eugenics affords.

The Relations of Feeble-mindedness to Delinquency. WALTER F. DEARBORN, Harvard University.

Current misconceptions in regard to the relationship of feeble-mindedness to delinquency and crime are due first to the unsupported belief that the character defects are inborn, and secondly to faulty statistics. A comparison of the intelligence, as rated by individual tests, of 3000 children, three years or more retarded in the public schools of Massachusetts, with evidence in regard to present and probable social and economic efficiency support conclusions of Cyril Burt that the line of demarcation of the feeble-minded, in so far as it can be made by tests, should be closer to an intelligence quotient of .50 rather than to .70 or above.

The disciplinary and delinquent cases in the above group were found in the greatest proportion among those with intelligence quotients of .85 to 1.00. This was also the case in Healy's recently published study of 1000 cases of juvenile delinquency. Recent findings indicating a lower average adult mental age than that on which the above-mentioned intelligence quotients were calculated would, if correct, further decrease the number of delinquents who can properly be considered feeble-minded. Finally studies of the behavior of children who have left the institutions for the feeble-minded after a sufficient period of training, whether on their own initiative or on the recommendation of the authorities, and similar studies of the histories of those who have, after a period of training, left special classes of the public schools show that the proportion of delinquency among these individuals is at least no greater than in the population at large. These studies indicate that learning and environment are more important factors in the causation of delinquency than is inheritance.

Our notions about these problems have been based too largely on our acquaintance with delinquents who have been caught and the feeble-minded in institutions rather than on the delinquents and feeble-minded who are at large among us.

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